

Amendments to the Claims:

The following is a listing of all claims and replaces all prior listings.

Listing of Claims:

1. (original) Position detection apparatus, comprising:
  - an accelerometer for providing an acceleration signal representative of acceleration of a movable element,
  - a combining network having an acceleration input for receiving said acceleration signal, a position input for receiving a position signal representative of position of said movable element, and an output for providing an inferred position signal representative of an inferred position of said movable element,
  - said network including a first signal processor for processing said acceleration signal to provide a modified acceleration signal, said first signal processor comprising a low-pass filter,
  - a second signal processor for processing said position signal to provide a modified position signal, and
  - a combiner for additively combining said modified acceleration signal with said modified position signal to provide said inferred position signal.
2. (original) Position detection apparatus in accordance with claim 1, further comprising:
  - a second accelerometer, for providing a reference element signal representative of acceleration of a reference element;
  - a differential acceleration measuring element, comprising
    - a first acceleration input for receiving said movable element acceleration signal,
    - a second acceleration input for receiving said reference element acceleration signal, and

an. output for providing a differential output signal representative of a differential acceleration of said movable acceleration signal and said reference element acceleration signal,

wherein said combining network acceleration input is for receiving said differential acceleration signal, and

wherein said combining network first signal processor is for processing said differential acceleration signal to provide said modified acceleration signal.

3. (cancelled).

4. (currently amended) Position detection method ~~in accordance with claim 3, for processing a movable element acceleration signal and a measured position signal representative of acceleration and position, respectively, of a movable element and wherein said acceleration signal is a movable element signal representative of acceleration of a movable element, and wherein said method is further~~ for processing a reference element acceleration signal representative of acceleration of a reference element to provide an inferred position signal, said method ~~further~~ comprising:

differentially combining said movable element acceleration signal and said reference element acceleration signal to provide a differential acceleration signal representative of differential acceleration of said movable element and said reference element;

low pass filtering said differential acceleration signal; and

additively combining the low pass filtered differential acceleration signal with said measured position signal to provide said inferred position signal.

5. (original) Closed loop motion control apparatus, comprising:

a movable element having a position,

an accelerometer for providing an acceleration signal representative of acceleration of said movable element,

a combining element, for combining a reference position signal and an inferred position signal to provide an error signal,

a controller, for providing a control signal responsive to said error signal,

an actuator, for applying a force, responsive to said control signal, to said movable element to change said position, said force resulting in said acceleration of said movable element,

a feedback loop, for providing said inferred position signal, said feedback loop comprising a combining network for providing said inferred position signal, said combining network including

an acceleration input for receiving said acceleration signal,

a position input for receiving a position signal representative of position of said movable element, and

an output for providing an inferred position signal representative of an inferred position of said movable element,

said network including a first signal processor for processing said acceleration signal to provide a modified acceleration signal, said first signal processor comprising a low-pass filter,

a second signal processor for processing said position signal to provide a modified position signal, and

a combiner for additively combining said modified acceleration signal with said modified position signal to provide said inferred position signal.

6. (original) Closed loop motion control apparatus in accordance with claim 5, further comprising

a reference element,

a second accelerometer, for providing a reference element acceleration signal representative of acceleration of said reference element;

a differential acceleration measuring element, comprising

a first acceleration input for receiving said movable element acceleration signal,

a second acceleration input for receiving said reference element acceleration signal, and

an output for providing a differential output signal representative of a differential acceleration of said movable acceleration signal and said reference element acceleration signal,

wherein said combining network acceleration input is for receiving said differential acceleration signal, and

wherein said combining network first signal processor is for processing said differential acceleration signal to provide said modified acceleration signal.

7. (original) Open loop position detection apparatus, comprising:

an accelerometer for providing an acceleration signal representative of acceleration of a movable element,

a combining network having an acceleration input for receiving said acceleration signal, a position input for receiving a position signal representative of position of said movable element, and an output for providing an inferred position signal representative of an inferred position of said movable element,

said network including a first signal processor for processing said acceleration signal to provide a modified acceleration signal, said first signal processor comprising a low-pass filter,

a second signal processor for processing said position signal to provide a modified position signal, and

a combiner for additively combining said modified acceleration signal with said modified position signal to provide said inferred position signal.

8. (original) Open loop position detecting apparatus in accordance with claim 7, further comprising

a second accelerometer, for providing a reference element acceleration signal representative of acceleration of a reference element;

a differential acceleration measuring element, comprising

a first acceleration input for receiving said movable element acceleration signal,

a second acceleration input for receiving said reference element acceleration signal, and

an output for providing a differential output signal representative of a differential acceleration of said movable acceleration signal and said reference element acceleration signal,

wherein said combining network acceleration input is for receiving said differential acceleration signal, and

wherein said combining network first signal processor is for processing said differential acceleration signal to provide said modified acceleration signal.

9. (new) Position detection method for processing a movable element acceleration signal and a measured position signal representative of acceleration and position, respectively, of a movable element and for processing a reference element acceleration signal representative of acceleration of a reference element to provide an inferred position signal, said method comprising:

low pass filtering said movable element acceleration signal to provide a low pass filtered movable element acceleration signal;

low pass filtering said reference element acceleration signal to provide a low pass filtered reference element acceleration signal;

differentially combining said low pass filtered movable element acceleration signal and said low pass filtered reference element acceleration signal to provide a differential acceleration signal representative of differential acceleration of said movable element and said reference element; and

additively combining the differential acceleration signal with said measured position signal to provide said inferred position signal.